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Two New Myobiid Mites (Acarina, Myobiidae) Parasitic on  
*Sorex shinto* (Insectivora, Soricidae)  
from Central Honshu, Japan

*With 4 Text-figures*

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**ABSTRACT** Two new myobiid mites parasitic on *Sorex shinto* Thomas, 1905, *Protomyobia nipponensis* spec. nov. and *Amorphacarus alpinus* spec. nov., which had been confused with *Protomyobia brevisetosa* Jameson, 1948, and *Amorphacarus elongatus* (Poppe, 1896), respectively, are described.

The three species of red-toothed shrews distributed in Japan, *Sorex caecutiens saevus* and *Sorex unguiculatus* from Hokkaido and *Sorex shinto* from central Honshu, had been considered to share the two myobiid mites, *Protomyobia brevisetosa* Jameson, 1948, and *Amorphacarus elongatus* (Poppe, 1896) (Ono, 1968; Uchikawa, 1971). Jameson and Dusbábek (1971) later described *Protomyobia onoi* as a parasite of *Sorex araneus* from Czechoslovakia and *S. unguiculatus* from Hokkaido, and noted that *Protomyobia* specimens taken from *S. unguiculatus* and *S. caecutiens saevus* in Hokkaido were virtually the same as those from Central Europe. Recently, Ono (1974) made a close examination on myobiid mites associated with the above-mentioned two shrews in Hokkaido and concluded that these mites constituted various taxa, some of which were so far unknown. This finding stimulated the present authors to re-examine the two mites parasitizing *S. shinto* in Honshu, Japan. Although these mites resembled respective allied species, both proved to be new to science as described below.

The present authors have used different nomenclature systems for the dorsal and ventral setae in studies of myobiid mites. In this paper, they will adopt the new nomenclature proposed by Fain (1973).

Measurements in the following text are means and ranges in parentheses taken from the type-series of specimens.

*Protomyobia nipponensis* spec. nov.

(Figs. 1 and 2)

[Japanese name: Togarinezumi-maru-kemochidani]

*Female* (Fig. 1). Body 416.8 (375–452)  $\mu$  long inclusive of gnathosoma, 280.0 (235–340)  $\mu$  wide.

*Dorsum* (Fig. 1A). Vertical internal setae (*vi*) minute, 9.1 (8–13)  $\mu$  long, situated cephalad from level of vertical external setae (*ve*). Vertical external setae dilated basally, 95.4 (83–109)  $\mu$  long. Scapular internal setae (*sc i*) 8.4 (8–10)  $\mu$  long, situated caudad from scapular external setae (*sc e*). Scapular external setae dilated basally, 122.5 (105–135)  $\mu$  long. Dorsal setae (*d*) minute; setae *d* 1 and 2 subequal in size, 10.6 (9–13)  $\mu$  long; *d* 3 9.1 (9–10)  $\mu$  long; *d* 4 dilated basally, 33.8 (33–35)  $\mu$  long; *d* 5 12.2 (11–13)  $\mu$  long. Lateral setae *l* 1 dilated basally, 165.8 (155–180)  $\mu$  long; *l* 2 minute, 8.3 (8–9)  $\mu$  long; *l* 3 and 4 10.3 (9–13) and 12.2 (11–13)  $\mu$  long, respectively; *l* 5 situated ventrally, 320.0 (280–350)  $\mu$  long. Genito-anal region surrounded with 5 pairs of fine setae, *ai*, *ae* and *g* 5–7.

*Venter* (Fig. 1B). Intercoxal setae *ic* 1–3 fine and long, measuring 61.9 (43–83), 72.5 (50–93) and 76.9 (63–100)  $\mu$  long, respectively; *ic* 4 12.2 (10–15)  $\mu$  long.

*Gnathosoma* (Fig. 1A and B). One pair each of long gnathosomal and hypostomal setae present ventrally and a pair of very minute, peg-like setae on dorsal surface. Pedipalp projecting by 2 segments, tibia and tarsus, each with one seta.

*Legs* (Fig. 1A and B). All legs with five segments. Tarsal claw formula:

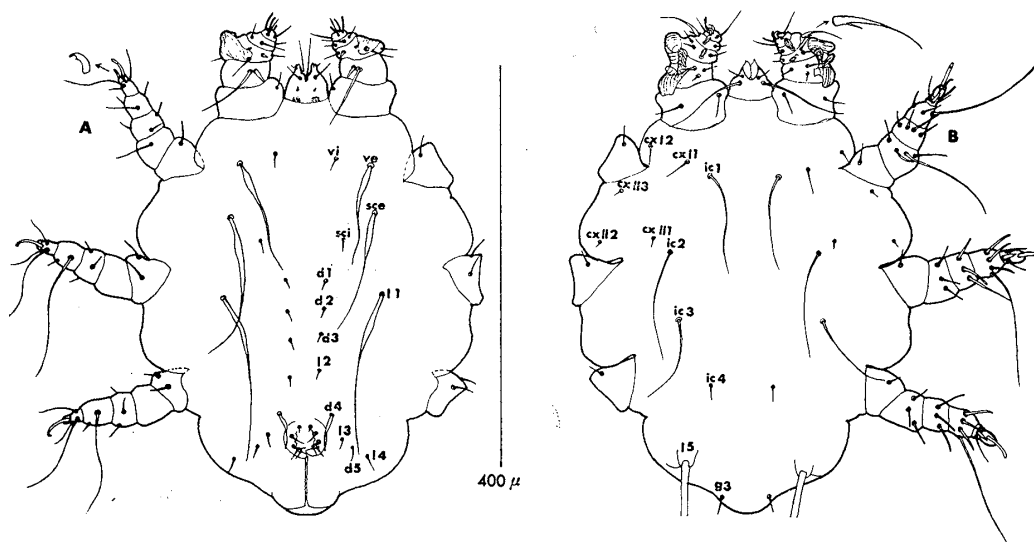


Fig. 1. *Protomyobia nipponensis* spec. nov. Female in dorsal view (A) and in ventral view (B).

2-2-1-1. Chaetotaxy on coxal area; trochanter-femur-genu-tibia-tarsus as follows: Leg I, 2; 3-5-8-6-6; leg II, 3; 2-5-7-6; leg III, 0; 3-3-6-6-6; leg IV, 0; 3-3-6-6-6. Nature of dorsal and ventral setae as illustrated in Fig. 1A and B. Three-lobed striated formation present ventrally on femur I and massive one on genu I. Three and 2 solenidia on tarsi I and II, respectively; one very minute solenidion on genu I.

*Male* (Fig. 2). Body 308.0 (290-340)  $\mu$  long inclusive of gnathosoma, 190.4 (165-232)  $\mu$  wide.

*Dorsum* (Fig. 2A). Setae *vi* 4.8 (4-6)  $\mu$  long, situated cephalad from level of setae *ve*. Setae *ve* dilated basally, 79.5 (75-83)  $\mu$  long. Setae *sci* 7.0 (5-9)  $\mu$  long, situated cephalad from level of setae *sce*. Setae *sce* 73.0 (68-80)  $\mu$  long, dilated basally. Setae *d1*, 2, 4 and 5 24.8 (23-28), 11.0 (10-13), 6.5 (5-9) and 8.3 (6-10)  $\mu$  long, respectively. Setae *l1* dilated basally, 129.5 (120-143)  $\mu$  long; *l4* 9.0 (8-11)  $\mu$  long; *l5* 288.8 (275-300)  $\mu$  long. Genital area and penis as illustrated in Fig. 2A.

*Venter* (Fig. 2B). Intercoxal setae *ic1* short, 9.0 (8-11)  $\mu$  long; *ic2-3* fine and much longer than *ic1*; *ic4* subequal in length to *ic1*.

*Gnathosoma and legs* (Fig. 2A and B). Essentially as in female.

*Materials*. Holotype: Female, collected on Happo-one, Hakuba Village, Nagano Prefecture, Japan, July 8, 1973. Allotype: Male, from the same locality on the same date as the holotype. Paratypes: Three males and one female from the same locality on the same date as the holotype, and one male and 2 females from the northern slope of Mt. Fuji, Yamanashi Prefecture, Japan, July 5, 1969, and November 11, 1968 (one female).

The holotype (NSMT-Ac8601) and allotype (NSMT-Ac8602) are deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo, Japan; a pair of the male and female paratypes in the collection of the Meguro Parasitological

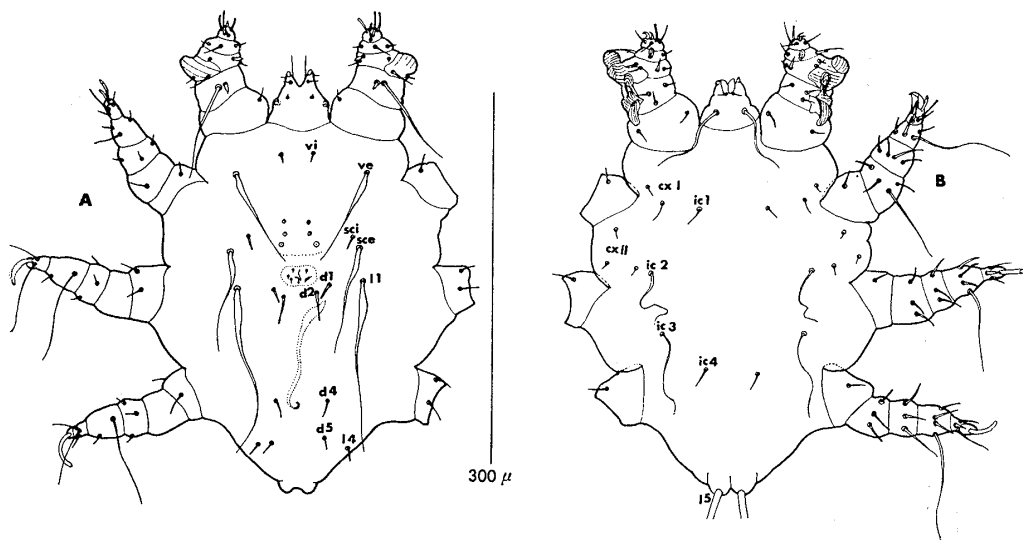


Fig. 2. *Protomyobia nipponensis* spec. nov. Male in dorsal view (A) and in ventral view (B).

Museum, Tokyo; the other paratypes in the Department of Parasitology, Faculty of Medicine, Shinshu University, Matsumoto, Nagano Prefecture, Japan.

*Host.* *Sorex shinto* Thomas, 1905.

*Remarks.* *Protomyobia nipponensis* spec. nov. is separable from all the known species of the genus by the following characteristics or combination of them: Very minute dorsal setae, *d* 1–3, and long intercoxal setae *ic* 1 in the female; scapular internal setae situated clearly cephalad from level of scapular external setae in the male; 3 pairs of coxal setae, *cx* II 1–3, in both sexes.

*Amorphacarus alpinus* spec. nov.

(Figs. 3 and 4)

[Japanese name: Togarinezumi-naga-kemochidani]

*Female* (Fig. 3). Body 484.4 (430–530)  $\mu$  long inclusive of gnathosoma, 232.7 (200–265)  $\mu$  wide.

*Dorsum* (Fig. 3A). Setae *vi* bulbous and with blunt tips, 30.4 (28–35)  $\mu$  long, situated cephalad from level of setae *ve*. Setae *ve* similar in nature to setae *vi*, 66.1 (60–73)  $\mu$  long. A pore present between *vi* and *ve*. Setae *sc i* 25.6 (23–28)  $\mu$  long, situated distinctly caudad from level of *sc e*. Setae *sc e* 174.7 (155–185)  $\mu$  long. Setae *d* 1–3 bulbous, 50.8 (48–53), 51.8 (50–54) and 52.6 (50–55)  $\mu$  long, respectively; distance between *d* 1 and 2 55.8 (43–64)  $\mu$ ; distance between *d* 2 and 3

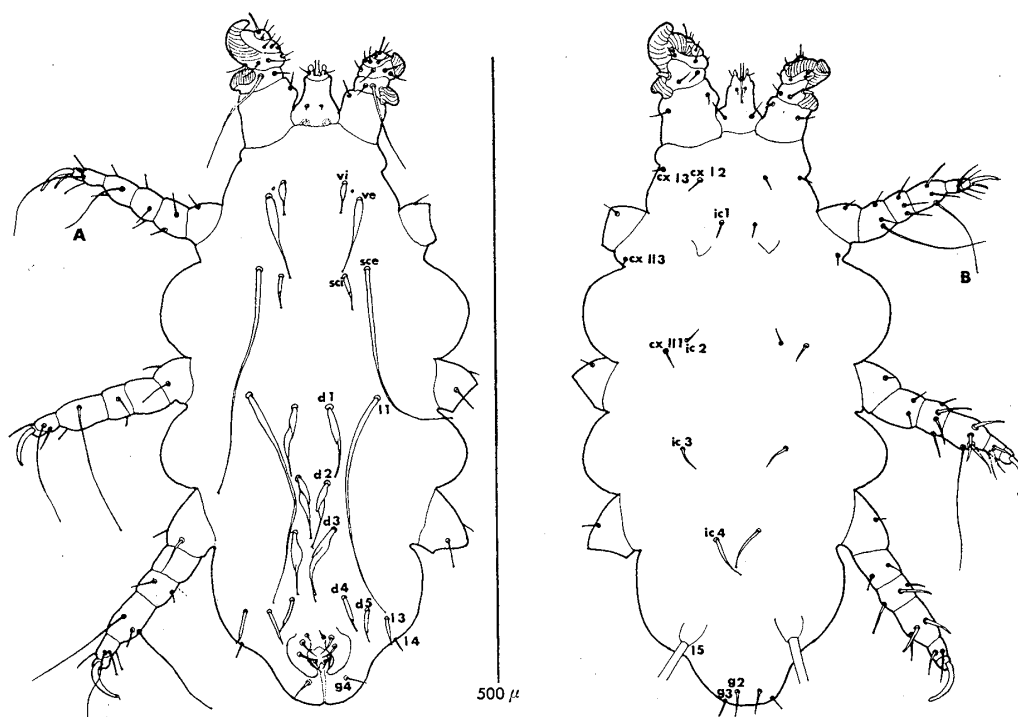


Fig. 3. *Amorphacarus alpinus* spec. nov. Female in dorsal view (A) and in ventral view (B).

32.8 (25–40)  $\mu$ ; ratio,  $d1-d2/d2-d3$ , 1.5–2.0. Setae  $d4-5$  equal in length, 50.0 (48–53)  $\mu$  long. Setae  $l1$  185.5 (173–203)  $\mu$  long;  $l3$  21.3 (19–23)  $\mu$  long;  $l4$  14.6 (13–18)  $\mu$  long;  $l5$  286.7 (280–300)  $\mu$  long. Genito-anal region surrounded with 5 pairs of minute setae,  $ai$ ,  $ae$ , and  $g5-7$ . A pair of genital setae,  $g4$ , present.

*Venter* (Fig. 3B). Setal arrangement as shown in Fig. 3B. Intercoxal setae,  $ic1-4$ , 11.0 (8–13), 11.9 (10–15), 18.8 (18–23) and 32.8 (28–38)  $\mu$  long, respectively; setae  $ic1-2$  very weakly developed.

*Gnathosoma* (Fig. 3A and B). One pair each of moderate gnathosomal and fine hypostomal setae present ventrally and a pair of very minute setae dorsally. Pedipalp projecting by 2 segments, each with one minute seta.

*Legs* (Fig. 3A and B). All legs with 5 segments; tarsus I distinct, though minute. Claw formula: 0–2–1–1; one claw on leg II slenderer and shorter than the other. Chaetotaxy on each leg as follows: I, 2; 3–5–8–5–3; II, 2; 2–5–6–6–6; III, 0; 3–2–6–6–6; IV, 0; 3–2–6–6–6. Three and 2 solenidia on tarsi I and II, respectively. One each of striated formation ventrally on femur, genu and tibia of leg I.

*Male* (Fig. 4). Body 392.0 (380–410)  $\mu$  long inclusive of gnathosoma, 152.0 (140–165)  $\mu$  wide.

*Dorsum* (Fig. 4A) Setae  $vi$  minute and spiniform, 8.5 (8–10)  $\mu$  long, originating from level of setae  $ve$ ;  $ve$  52.8 (50–58)  $\mu$  long. A pair of pores present just anterior to bases of  $ve$ . Setae  $sci$  11.0 (10–13)  $\mu$  long, situated slightly cephalad to distinctly caudad from level of  $sce$ ;  $sce$  57.5 (50–64)  $\mu$  long. Setae  $d1$  and 5

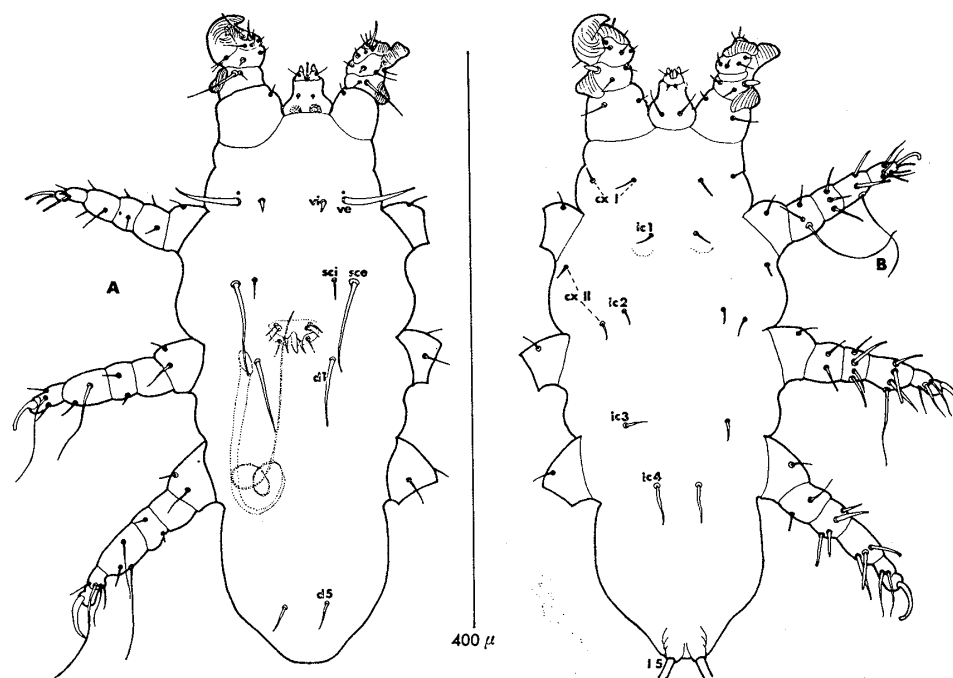


Fig. 4. *Amorphacarus alpinus* spec. nov. Male in dorsal view (A) and in ventral view (B).

47.0 (43–53) and 14.3 (13–18)  $\mu$  long, respectively.

*Venter* (Fig. 4B). Intercoxal setae, *ic* 1–4, 9.5 (9–10), 8.0 (8–8), 9.5 (9–10) and 20.3 (18–23)  $\mu$  long, respectively.

*Gnathosoma and legs* (Fig. 4A and B). Essentially as in female.

*Materials*. Holotype: Female, collected on Happo-one, Hakuba Village, Nagano Prefecture, Japan, July 8, 1973. Allotype: Male, collected on the northern slope of Mt. Fuji, Yamanashi Prefecture, Japan, July 5, 1969. Paratypes: One male and 3 females from the same locality on the same date as the holotype; one male and 5 females from the same locality on the same date as the allotype; one male collected on Mt. Johnen, Nagano Prefecture, August, 1960; one male from Kamikochi, Nagano Prefecture, August 8, 1972.

The holotype (NSMT-Ac8603) and allotype (NSMT-Ac8604) are deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo, Japan; a pair of the male and female paratypes in the collection of the Meguro Parasitological Museum, Tokyo; the other paratypes in the Department of Parasitology, Faculty of Medicine, Shinshu University, Matsumoto, Japan.

*Host*. *Sorex shinto* Thomas, 1905.

*Remarks*. *Amorphacarus alpinus* spec. nov. closely resembles *A. elongatus* (Poppe, 1896). Differential characteristics are as follows: In the female of the new species, the ratio,  $d\ 1-d\ 2/d\ 2-d\ 3$ , is higher than 1.5, whereas that is lower than 1.2 in *A. elongatus*; the distance between *d* 1 and 2 in average exceeds the length of *d* 1 in the new species, and consequently *d* 1 does not usually reach the base of *d* 2; intercoxal setae, *ic* 2, develop more weakly in the new species than in *A. elongatus*. In the male, the setae *d* 1 are twice as long as those of *A. elongatus*; the setae *sc i* are situated more anteriad from *sc e* in *A. elongatus* than in *A. alpinus* spec. nov.

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